REMARKS/ARGUMENTS

Claims 2, 5-7, 9-15, and 27-32 are pending. Claim 2 has been amended to incorporate the limitations of claim 4. Claims 4 and 26 have been canceled. Claim 5 has been amended to be dependent on claim 2.

Statement of Common Ownership

The present Application No. 09/536,347 and U.S. Patent No. 6,341,574 were, at the time of the invention of Application No. 09/536,347 was made, owned by Lam Research Corporation.

The Examiner objected to claim 26. Claim 26 has been canceled.

The Examiner rejected claims 2, 4-7, 12, and 26-32 under 35 U.S.C. 103 (a) as being unpatentable over Dandl (U.S. Patent 5,370,765) in view of Moslehi et al. (U.S. Patent 5,464,499) or Sekine et al. (U.S. Patent 5,44,207), or Hershkowitz et al. (U.S. Patent 5,302,205). It would not be obvious to combine Dandl with Moslehi, Sekine, or Hershkowitz to obtain the invention as recited in claim 2. The Examiner stated that it would have been obvious to modify the apparatus of Dandle so as to dispose the plurality of magnetic elements extending substantially from a first end of the process chamber to a chuck because this is an alternative way to generate the magnetic field and enhance the plasma in the processing chamber.

The Examiner used magnetic array 105 of FIG. 4A as an example of an array that may be replaced by magnets that extend substantially from the first end to the chuck. Col. 7, lines 18-19, of Dandl states that FIG. 4B is a fragmentary plan view of the rectilinear array applicator. This shows that the magnets of the magnets 105 of the magnetic array extend across the rectilinear array. If the magnets also extend substantially to the chuck, such magnets would touch the substrate being processed, which would hurt uniformity. Therefore replacing the magnets of Dandl with magnets as taught in Moslehi, Sekine, or Hershkowitz would not obtain the invention as recited in claim 2. It would not be obvious to use magnets

as taught in Moslehi, Sekine, or Hershkowitz, in the apparatus of Dandl to obtain the device as recited in claim 2.

The Examiner stated that it would be obvious to substitute the magnets of Moslehi, Sekine, or Hershkowitz into Dandl, since such magnets are an alternative way to generate the magnetic field and enhance the plasma in the processing chamber. As mentioned above, extending the magnets 105 of Dandl to the chuck is not an alternative way to generate the magnetic field, since by doing so the apparatus would be unworkable.

In addition, the magnetic field by the magnets 105 in FIG. 4A of Dandl generates a vertical magnetic field as shown by the arrows in the magnets 105. The magnets that extend substantially from the first end to the chuck generate a magnetic field that is horizontal in the same direction along the length of the magnet. Therefore, the magnets as claimed do not generate the same magnetic field as Dandl and therefore cannot be an alternative way to generate the magnetic field of Dandl. For at least these reasons, claim 2 is not made obvious by Dandl in view of Moslehi, Sekine, or Hershkowitz.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Moslehi, Sekine, or Hershkowitz and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 10-11 and 15 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Moslehi, Sekine, or Hershkowitz and further in view of Grunenfelder (U.S. Patent 5,399,253) or Barankova et al. (WO 99/27758).

The Examiner rejected claims 2, 4-7, 12, 15, and 26-32 under 35 U.S.C. 103 (a) as being unpatentable over Dandl (U.S. Patent 5,370,765) in view of Bailey, III et al. (U.S. Patent 6,341,574) or Tokyo Electron LTD, JP 7-130495. It would not be obvious to combine Dandl with Bailey III or Tokyo Electron LTD to obtain the invention as recited in claim 2. The Examiner stated that it would have been obvious to modify the apparatus of Dandle so as to dispose the plurality of magnetic elements extending substantially from a first end of the process chamber to a chuck because this is an alternative way to generate the magnetic field and enhance the plasma in the processing chamber.

The Examiner used magnetic array 105 of FIG. 4A as an example of an array that may be replaced by magnets that extend substantially from the first end to the chuck. Col. 7, lines 18-19, of Dandl states that FIG. 4B is a fragmentary plan view of the rectilinear array applicator. This shows that the magnets of the magnets 105 of the magnetic array extend across the rectilinear array. If the magnets also extend substantially to the chuck, such magnets would touch the substrate being processed, which would hurt uniformity. Therefore, replacing the magnets of Dandl with magnets as taught in Bailey III or Tokyo Electron LTD would not obtain the invention as recited in claim 2. It would not be obvious to use magnets as taught in Bailey III or Tokyo Electron LTD, in the apparatus of Dandl to obtain the device as recited in claim 2.

The Examiner stated that it would be obvious to substitute the magnets of Bailey III or Tokyo Electron LTD into Dandl, since such magnets are an alternative way to generate the magnetic field and enhance the plasma in the processing chamber. As mentioned above, extending the magnets 105 of Dandl to the chuck is not an alternative way to generate the magnetic field, since by doing so the apparatus would be unworkable.

In addition, the magnetic field by the magnets 105 in FIG. 4A of Dandl generates a vertical magnetic field as shown by the arrows in the magnets 105. The magnets that extend substantially from the first end to the chuck disclosed in Bailey III or Tokyo Electron LTD generate a magnetic field that is horizontal in the same direction along the length of the magnet. Therefore, the magnets as claimed do not generate the same magnetic field as Dandl and therefore cannot be an alternative way to generate the magnetic field of Dandl.

In addition, as stated above Bailey is commonly owned with the present application. For at least these reasons, claim 2 is not made obvious by Dandl in view of Bailey III or Tokyo Electron LTD.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Bailey III or Tokyo Electron LTD and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 2, 4-7, 12, and 26-32 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz et al. (U.S. Patent 5,302,205). It would not be obvious to

combine the apparatus of FIG. 5 of Hershkowitz with the magnets of FIG. 3 of Hershkowitz to obtain the invention as recited in claim 2. The Examiner stated that it would have been obvious to modify the apparatus of FIG. 5 of Hershkowitz so as to dispose the plurality of magnetic elements extending substantially from a first end of the process chamber to a chuck because this is an alternative way to generate the magnetic field and enhance the plasma in the processing chamber. Nothing in Hershkowitz suggests that the magnets of FIG. 3 may be used in the device of FIG. 5. In addition, Hershkowitz lacks a clear description as to what exactly is the configuration shown in FIG. 3. In addition, claim 2 has been amended to incorporate the limitation of claim 4, reciting that the magnetic filed has an azimuthally symmetric radial gradient. Regarding the configuration of FIG. 3, what can be guess about the configuration would indicate that the configuration of FIG. 3 does not provided a magnetic filed that has an azimuthally symmetric radial gradient. Hershkowitz does not suggest the need of creating such an azimuthally symmetric radial gradient from magnets extending from one end of the chamber to the chuck. For at least these reasons, claim 2, as amended, is not made obvious by Hershkowitz.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz as applied to claims 2, 4-7, 12, 26-31 above and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 10-11 and 15 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz and further in view of Grunenfelder (U.S. Patent 5,399,253) or Barankova et al. (WO 99/27758).

Claims 5-7, 9-15, and 27-32 each depend either directly or indirectly from independent claim 2, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to independent claim 2. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record.

For example, claim 14 further recites that the magnetic elements are individually contained within sleeves. None of the cited references recite that the magnetic elements are individually contained within sleeves. Taira, in col. 4, lines 15 to 62, teaches that if a plurality of magnetic elements 5 and 5' are used, then all magnetic elements are placed in the

same sleeve, not individually contained within sleeves. It is only when one permanent magnet is used, as shown in fig. 4, that the single permanent magnet is individually contained in a sleeve. The teaching of when only one magnet is used it is placed in an individual sleeve, does not make obvious a plurality of magnetic elements where each magnetic element is in an individual sleeve. In addition, none of the references recites sleeves (plural). None of the references teaches more than one sleeve. Therefore, it would not be obvious under the cited references to use both a plurality of magnetic elements and have each magnetic element individually contained within sleeves. An advantage of containing a plurality of magnetic elements in individual sleeves over containing a plurality of magnets in one sleeve is the reduction of sleeve profile exposed to the plasma.

Claim 32 further recites a dielectric window at the top of the substantially cylindrical shape. Dandl does not disclose such a dielectric window at the top of the chamber. For at least these reasons, claims 5-7, 9-15, and 26-32 are not anticipated or made obvious by the cited references.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-8300.

Respectfully submitted,
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